

I claim:

1. A tool for actuating a workpiece, the workpiece having a first contact surface and a second contact surface, the workpiece being actuated when the second contact surface is moved relative to the first contact surface and releasing energy when being actuated, said tool comprising:

5 a fixed member for contacting the first contact surface of the workpiece;

a movable member supported for generally linear movement relative to said fixed member, said movable member for contacting the second contact surface of the workpiece;

10 a trigger mechanism for urging said movable member into engagement with the second contact surface, said trigger mechanism having stored energy therein and adapted to apply a load to said movable member whereby said movable member moves over a first range of movement for moving the second contact surface relative the first contact surface in response to said load for actuating the workpiece, and said stored energy moving said movable member when said movable member no longer detects a reaction force from the  
15 second contact surface to thereby move said movable member over a second range of movement in response to the stored energy; and

a sensor for detecting at least a portion of said second range of movement of said movable member and generating a signal in response to said portion of said second range movement of said movable member whereby said sensor generates a signal at least when the  
20 workpiece is actuated.

2. The tool according to Claim 1, wherein said sensor detects said first and second range of movements of said movable member.

3. The tool according to Claim 2, wherein said sensor comprises a coil, said movable member including a magnet wherein said coil detects movement of said magnet to thereby detect said range of movements of said movable member.

4. The tool according to Claim 2, wherein said sensor comprises a light sensor, said movable member including a plurality of markings, wherein said light sensor detects

movement of said markings to thereby detect said range of movements of said movable member.

5. The tool according to Claim 1, wherein said fixed member comprises a housing, said movable member being supported in said housing and extending through at least a portion of said housing when moving over said first and second range of movements.

6. The tool according to Claim 5, wherein said fixed member further comprises a rod, said rod extending through said housing, and said movable member supported on said rod.

7. The tool according to Claim 6, wherein in said movable member comprises a sleeve, said rod extending through said sleeve.

8. The tool according to Claim 6, wherein said rod projects from said housing and forms a fixed contact surface for contacting the first contact surface of the workpiece.

9. The tool according to Claim 1, wherein said trigger mechanism comprises an energy storage member, said energy storage member applying said load on said movable member to thereby move said movable member.

10. The tool according to Claim 9, wherein said energy storage member comprises a spring.

11. The tool according to Claim 10, wherein said spring comprises a coil spring.

12. The tool according to Claim 9, wherein said trigger mechanism comprises a lever, said lever being pivotally mounted to said fixed member and urging said energy storage member to apply said load to said movable member.

13. A tool for actuating a workpiece, the workpiece having a first contact surface and a second contact surface, the workpiece being actuated when the second contact surface

is moved relative to the first contact surface and releasing energy when being actuated, said tool comprising:

- 5                   a housing;
- a first member supported by said housing, said first member being adapted for contacting the first contact surface of the workpiece;
- a second member supported by said first member for generally linear movement relative to said housing and said first member, said second member being adapted
- 10   for contacting the second contact surface of the workpiece;
- a trigger mechanism for urging said second member into engagement with the second contact surface, said trigger mechanism including an energy storage member and applying a load to said second member with said energy storage member whereby said second member moves over a first range of movement for moving the second contact surface
- 15   relative the first contact surface in response to said load for actuating the workpiece, said energy storage member having stored energy, at least a portion of said stored energy being released when said second member no longer detects a reaction force from the second contact surface to thereby move said second member over a second range of movement in response to the release of the stored energy; and
- 20                   a sensor for detecting at least said second range of movement of said second member and generating a signal in response to said second range movement of said second member whereby said sensor generates at least a signal at least when the workpiece is actuated.

14.               The tool according to Claim 13, wherein said energy storage member comprises a spring.

15.               The tool according to Claim 14, wherein said spring comprises a coil spring.

16.               The tool according to Claim 14, wherein said trigger mechanism comprises a lever, said lever being pivotally mounted to said first member and urging said spring to apply said load to said second member.

17.               The tool according to Claim 16, wherein said sensor detects said first and second range of movements of said second member.

18. The tool according to Claim 17, wherein said sensor comprises a coil, said second member including a magnet wherein said coil detects movement of said magnet to thereby detect said range of movements of said second member.

19. The tool according to Claim 17, wherein said sensor comprises a light sensor, said second member including a plurality of markings, wherein said light sensor detects movement of said markings to thereby detect said range of movements of said second member.

20. The tool according to Claim 13, wherein said first member comprises a rod, said rod extending through said housing, and said second member supported on said rod.

21. The tool according to Claim 20, wherein in said second member comprises a sleeve, said rod extending through said sleeve.

22. The tool according to Claim 20, wherein said rod projects from said housing and forms a first contact surface for contacting the first contact surface of the workpiece.

23. A tool for actuating a clip-less clamp, the clamp having a first contact surface and a second contact surface, the clamp being actuated when the second contact surface is moved relative to the first contact surface and releasing energy when being actuated, said tool comprising:

- 5 a housing;
- a rod supported in said housing, said rod for contacting the first contact surface of the clamp;
- a sleeve supported by said rod for generally axial movement through said housing relative to said housing, said sleeve for contacting the second contact surface of the
- 10 clamp;
- a trigger mechanism for urging said sleeve into engagement with the second contact surface, said trigger mechanism having an energy storage member having stored energy therein and adapted to apply a load to said sleeve whereby said sleeve moves over a first range of movement for moving the second contact surface relative the first contact

15 surface in response to said load for actuating the clamp, and said energy storage member releasing at least a portion of said stored energy when said sleeve no longer detects a reaction force from the second contact surface to thereby move said sleeve over a second range of movement in response to the release of the stored energy; and

20 a sensor for detecting said second range of movement of said sleeve and generating a signal in response to said second range movement of said sleeve whereby said sensor generates a signal when the clamp is actuated.

24. The tool according to Claim 23, wherein said sensor comprises a proximity switch.

25. The tool according to Claim 24, wherein said sleeve includes a weighted member, said weighted member contacting said sensor when said sleeve moves over said second range of movement.

26. The tool according to Claim 24, further comprising a spring interposed between said sensor and said weighted member, said weighted member compressing said spring when said sleeve moves over said second range of motion to actuate said sensor only after said spring is at least partially compressed.

27. The tool according to Claim 23, wherein said energy storage member comprises a spring.

28. The tool according to Claim 27, wherein said spring comprises a coil spring.

29. The tool according to Claim 23, wherein said trigger mechanism comprises a lever, said lever being pivotally mounted to said housing and urging said energy storage member to apply said load to said sleeve.

30. A method of detecting actuation of a workpiece, the workpiece generating a release of energy when actuated, said method comprising:  
urging a first member to contact the workpiece;

5                   applying a force to the workpiece with a second member to actuate the  
workpiece;  
                  sensing when the first member accelerates relative to the second member to  
thereby detect the actuation of the workpiece.

31.               The method according to Claim 30, wherein said applying a force comprises  
applying a compression force.

32.               The method according to Claim 31, wherein said applying a force comprises  
applying a tension force.

33.               The method according to Claim 30, wherein said sensing comprises detecting  
light impulses.

34.               The method according to Claim 30, wherein said urging includes urging the  
first member with a spring wherein the spring moves the first member relative to the second  
member when the workpiece is actuated.